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DWARFMISTLETOE SURVEY IN COEUR D'ALENE NATIONAL FOREST

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METHOD

A roadside survey to determine the distribution and abundance of dwarfmistletoe (Arceuthobium spp.) in the Coeur d'Alene National Forest was made in 1957. Surveys were made on each ranger district except the St. Regis; they included intermingled and adjacent alienated lands. This roadside reconnaissance was made by traveling a portion of the roads at about 10 miles per hour, making frequent stops to examine the stands and recording locations of infection. In the time available, as many roads as possible were traveled in each ranger district.

Continuous observations were made on all tree species for dwarfmistletoe infection. However, detailed information was recorded only for western larch. Whenever dwarfmistletoe was encountered in Douglas-fir, lodgepole pine, ponderosa pine, or other species, the approximate location and extent of the infected area was recorded (fig. 1).

During travel through stands containing 10 percent or more of western larch, the following information was recorded:

Degree of dwarfmistletoe infection

Free	Stand free of dwarfmistletoe.
Light	Less than one-third of the trees infected.
Moderate	One-third to two-thirds of the trees infected.
Heavy	More than two-thirds of the trees infected.

Type of stand

Nonmerchantable

Class I	Even-aged stands of sapling and small poles with no overstory.
Class II	Even-aged stands of large poles with no overstory.

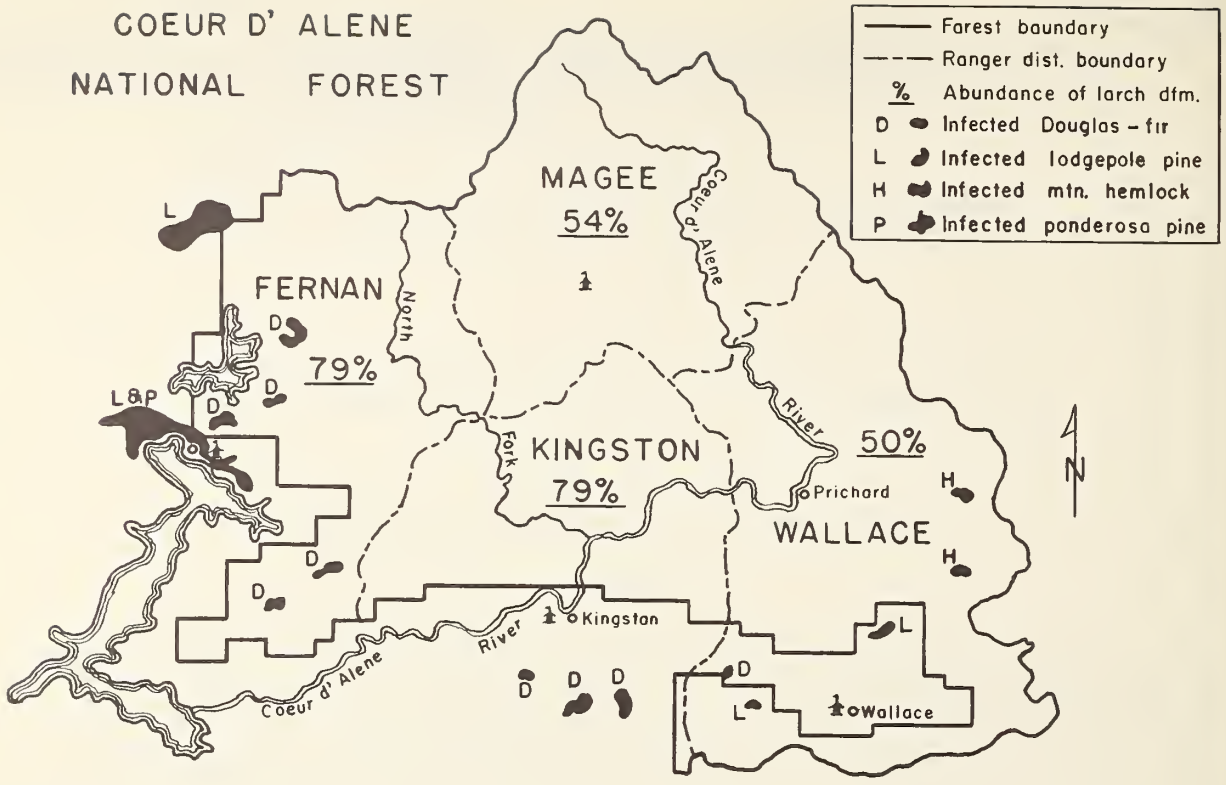

Figure 1.--Abundance of western larch dwarfmistletoe and location of infected Douglas-fir, lodgepole pine, ponderosa pine, and mountain hemlock stands in the Coeur d'Alene National Forest as determined from roadside survey.

Merchantable

Class III	Mature or virgin stands.
Class IV	Regenerated burns with scattered groups or individual overstory larch fire residuals.

Stand composition

Low	Stands with 10 percent but less than 25 percent western larch.
Medium	Stands with 25 percent to 50 percent western larch.
High	Stands with more than 50 percent western larch.

Observations were made on a continuous strip, one or one-half chain wide, depending on stand density, along the right-hand side of the road. Odometer readings were noted and distances recorded to the nearest one-tenth mile whenever a change occurred in any of the above conditions. This gave a distance of one-tenth mile as the basic unit on which the abundance and degree of larch dwarfmistletoe infection were recorded. In merchantable stands

having two stories, the degree of infection in the understory was recorded separately from that in the overstory.

RESULTS AND DISCUSSION

The abundance of larch dwarfmistletoe in each ranger district was determined from the roadside survey (table 1 and fig. 1). A total of 230.2 miles of roadside strip was checked in western larch stands. Larch dwarfmistletoe was found along 148.4 of these miles, or in 64 percent of the stands traversed. Incidence of dwarfmistletoe in the Fernan and Kingston Districts was 20 to 29 percent higher than in the other two districts--probably the result of the stands' history. Because of accessibility, stands on the Fernan and Kingston Districts have had fire protection and selective cutting longer than other districts. Both these conditions are known to intensify dwarfmistletoe and may have increased the affected acreage in these two districts during the past 70 years. For all districts combined, heavy damage (more than two-thirds of the trees infected) was present in about 60 percent of the infected stands.

Table 1.--Incidence of dwarfmistletoe in western larch stands by degree of infection, Coeur d'Alene National Forest, 1957 1/

Ranger district	Total miles of roadside strip	Proportion of total miles traveled through western larch stands, by infection classes				
		Dwarfmistletoe infected miles				Dwarf-mistletoe free miles
		Light	Moderate	Heavy	Total	
	Number	Percent	Percent	Percent	Percent	Percent
Kingston	32.5	18	16	45	79	21
Fernan	72.0	13	18	48	79	21
Magee	74.7	5	13	36	54	46
Wallace	51.0	14	9	27	50	50
All districts	230.2	11	14	39	64	36

1/ Includes intermingled and adjacent alienated lands.

No great difference in frequency of infection was evident in the overstory of merchantable stands (table 2). Although damage in nonmerchantable stands of large poles (class II) was more than four times that in small poles and saplings (class I), it was still considerably less, in most districts, than that in the overstory of merchantable stands. In most areas, dwarfmistletoe was much more abundant in the understory of merchantable stands (82 percent) than in nonmerchantable stands having no overstory.

Table 2.--Abundance of western larch dwarfmistletoe in different types of stands, Coeur d'Alene National Forest, 1957

Ranger district	Incidence of larch dwarfmistletoe by various types of stands[1/]				
	Immature stands (no overstory)		Merchantable stands		
			Overstory		Understory
	Class I (small poles & saplings)	Class II (large poles)	Class III (mature)	Class IV (fire residuals)	Classes III & IV
	Percent	Percent	Percent	Percent	Percent
Kingston	26	99	100	86	81
Fernan	30	72	97	98	88
Magee	4	40	93	96	79
Wallace	17	57	73	100	80
All districts	15	69	94	96	82

1/ Based on the distance traveled in infected stands expressed as a percentage of the total distance traveled in each type of stand.

Abundance of the larch dwarfmistletoe was not correlated with the amount of larch present in the stands (table 3). Infection was as common in stands having only a few larch as in stands containing a moderate or high percentage of larch.

Table 3.--Abundance of western larch dwarfmistletoe in stands having low, medium, and high composition of larch, Coeur d'Alene National Forest, 1957

Ranger district	Incidence of larch dwarfmistletoe by composition classes[1/]			
	Low	Medium	High	All compositions
	Percent	Percent	Percent	Percent
Kingston	89	66	68	79
Fernan	76	79	91	79
Magee	40	68	67	54
Wallace	63	46	32	50
All districts	64	66	63	64

1/ Based on the distance traveled in infected stands expressed as a percentage of the total distance traveled in each composition class.

No dwarfmistletoe was found in Douglas-fir and lodgepole stands in the interior portion of the forest; however, infection in these two species occurs along the southern and western borders of the forest (fig. 1). Considerable infection is present in the ponderosa pine and lodgepole pine around Coeur d'Alene Lake, Fernan Lake, and along the Spokane River to Post Falls and beyond. Dwarfmistletoe was observed in mountain hemlock in the Tributary Creek drainage above the Jack Waite mine and about 7 miles east of Murray on the road to Thompson Pass. Additional observations will be needed to determine the extent of dwarfmistletoe in mountain hemlock and to determine whether the nearby western hemlock is also infected.

SUMMARY

A survey to determine the abundance of dwarfmistletoe in the Coeur d'Alene National Forest was made in 1957. Larch dwarfmistletoe was found in 64 percent of the stands traversed.

No difference in the abundance of larch dwarfmistletoe was found in the overstory of different types of merchantable stands; or in low, medium, and high compositions of larch. However, the dwarfmistletoe was 5.5 times as abundant in the understory of merchantable stands as in small pole and sapling stands having no overstory, and 1.2 times as abundant as in large pole stands having no overstory.

Infected Douglas-fir stands are common, and several infected lodgepole pine stands occur along the southern and western borders of the forest. Dwarfmistletoe was found in mountain hemlock at two locations on the west slope of the Bitterroot Mountains.